The Professional Medical Journal
www.theprofesional.com

ORIGINAL PROF-2348

TUBERCULOSIS;
THE SPECTRUM IN ADMITTED CHILDREN AT BAHAWAL VICTORIA HOSPITAL

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Article received on:
03/07/2013
Accepted for publication:
08/07/2014
Received after proof reading:
16/10/2014

ABSTRACT… Objective: The purpose of study is to know the admission rate and spectrum of the tuberculosis in children admitted in the pediatric unit of a high endemic country. **Methods and Material:** This retrospective study was conducted at the Pediatric unit-I, Bahawal Victoria Hospital Bahawalpur. The records of children older than one month but below 15 years of age diagnosed as tuberculosis (TB) during the years 2007-2011 were reviewed and were included for the study. The data (age, sex, history of contact, BCG vaccination, tuberculin test, diagnosis) were entered on a proforma. Data were entered into SPPS version 13 (Statistical Package for Social Sciences) package were presented as rates and proportions. **Results:** There were 72765 children (excluding children below the age of one month) admitted during the period of five years (2007-2011), out of which 847(1.16%) were diagnosed as tuberculosis. There was no consistent fall in admission rate over the years due to TB cases. There were 61% male cases. The maximum cases were reported under the age of 4 years (46%). Out of total 847 TB cases BCG scar was present in only 410 (48.4%) cases. The history of contact with adult TB case was found in 243 (28.7%). Tuberculin skin test was positive (≥10mm) in 309 (36.5%) cases. The most common forms of TB were tuberculous meningitis and pulmonary tuberculosis each accounting for 37.5% cases. Other forms of tuberculosis included TB pleural effusion 12.5%, TB abdomen 7.1%, miliary TB 3.1% and TB arthritis 2.2%. Conclusions: The most common form of TB is meningitis and pulmonary each accounting for 37.5% cases and the maximum cases were reported under the age of 4 years.

Key words: Tuberculous meningitis, pulmonary tuberculosis, contact, tuberculin test

Article Citation: Rehman A, Tahseen SA, Chaudhry TA. Tuberculosis; the spectrum in admitted children at Bahawal Victoria Hospital. Professional Med J 2014;21(5):914-917.

INTRODUCTION

Tuberculosis (TB) – an infectious airborne disease – is a major global health problem. Each year, there are around nine million new cases of TB, and about two million deaths1. All countries are affected. Pakistan is included among the top five countries with the largest number of cases. The burden as well as mortality of childhood tuberculosis (defined as tuberculosis in children aged less than 15 years) in Pakistan is difficult to assess as there is no easy-to-use and accurate diagnostic test for TB in children. Most children have paucibacillary TB that is harder to diagnose with sputum smear microscopy and culture. Many children, especially younger children, are not able to expectorate sputum. Diagnosis is usually made using a combination of clinical criteria and a non-specific test for tuberculous infection, but there is no universally applied diagnostic algorithm. Besides diagnostic challenges, children diagnosed with TB are not always reported to national surveillance systems because of the lack of linkages among individual pediatricians, pediatric hospitals and national TB programme2. It is estimated that about 15% of the TB cases occur among children less than 15 years of age in low-income countries3. Childhood TB comprises a diversity of manifestations, both pulmonary and extrapulmonary4,5. Moreover, most of the published data is mainly from low-burden countries5. The purpose of study is to know the admission rate and spectrum of the disease in children admitted in the pediatric unit of a high endemic country.

METHODS AND MATERIAL

This study was conducted at the Pediatric unit-I, Bahawal Victoria Hospital Bahawalpur. The records of children older than one month but below

15 years of age diagnosed as tuberculosis during the years 2007-2011 were reviewed. Patients were classified as having probable TB if they met ≥2 of the following criteria:

- Positive tuberculin skin test (induration of ≥10 mm)
- Suggestive clinical features consistent with TB
- Direct household contact with an individual known to have TB infection
- Rradiographic findings (hilar lymphadenopathy, miliary shadows) compatible with TB
- Histological appearance of biopsy material (granulomatous tubercles or caseous necrosis)
- Cerebrospinal fluid (CSF) abnormalities, such as pleocytosis with high lymphocytes (>20/cumm), high proteins (>45 mg/dl) and low glucose concentration (below 40 mg/dl or 50% of the simultaneous blood glucose measurement)
- Cranial CT scan showing two or more of the following: hydrocephalus, basal enhancement or tuberculoma
- Good response to ≥2 anti-TB drugs6.

Children with age one month to 15 years of age having probable tuberculosis were included for the study. Children with incomplete medical records or with previously verified TB or who were suspected to have received previous treatment were excluded. The data (age, sex, history of contact, BCG vaccination, tuberculin test, diagnosis, and outcome) were entered on a proforma. Data were entered into SPPS version 13 (Statistical Package for Social Sciences) package. Data were presented as rates and proportions.

RESULTS

There were 72765 children (excluding children below the age of one month) admitted during the period of five years (2007-2011) period, out of which 847(1.16%) were diagnosed as tuberculosis. The year wise details are shown in table-I. There was no consistent fall in admission rate due to be TB cases during this period. There were 61% male and female are 57% (Table-II). The maximum cases were reported under the age of 4 years (Table-III). Out of total 847 TB cases BCG scar was present in only 410 (48.4%). The history of contact with adult TB case was found in 243 (28.7%). Tuberculin skin test was positive (≥10mm) in 309 (36.5%) cases. The various types of tuberculosis seen in admitted children are shown in table-III, the most common being tuberculous meningitis and pulmonary tuberculosis each accounting for 37.5 cases.

Year	Total admissions	TB cases (%)
2007	7956	106 (1.33)
2008	12803	176 (1.37)
2009	15470	177 (1.14)
2010	20114	177 (0.87)
2011	16423	211 (1.28)
Total	72765	847 (1.16)

Table-I. Total admissions and cases of tuberculosis during 2007-2011

Age	Male (%)	Female (%)	Total (%)
<4 years	238 (61)	152 (39)	390 (46)
4-10 years	103 (63.6)	59 (36.4)	162 (19)
>10 years	176 (59.3)	121 (40.7)	297 (35)
Total	517 (61)	330 (39)	847 (100)

Table-II. Age and sex distribution of TB cases

TYPES	2007 (%)	2008 (%)	2009 (%)	2010 (%)	2011 (%)	Total (%)
TB abdomen	07 (6.6)	14 (7.9)	05 (2.8)	20 (11.3)	14 (6.6)	60 (7.1)
Pulmonary TB	35 (33)	61 (34.7%)	71 (40.1)	80 (45.2)	71 (33.6)	318 (37.5)
TB Pleural effusion	25 (23.6)	17 (9.7%)	36 (20.3)	12 (6.8)	16 (7.6)	106 (12.5)
TB meningitis	36 (34)	77 (43.7)	60 (33.9)	53 (29.9)	92 (43.6)	318(37.5)
TB arthritis/spine	02 (1.9)	05 (2.8)	00	03 (1.7)	09 (4.3)	19 (2.2)
Miliary TB	01 (1)	02 (1.1)	05 (2.8)	09 (5.1)	09 (4.3)	26 (3.1)
Total	1O6 (100)	176 (100)	177 (100)	177 (100)	211 (100)	847 (100)

Table-III- Various types of tuberculosis in admitted children

DISCUSSION

The cases included in this study were of 'probable tuberculosis' as for 'confirmed tuberculosis' cases microbiological evidence is needed and that facility is not available in this hospital.

This study did not show any consistent fall in admission rate due to TB cases. The data from other countries show various pattern in change in admission rate over the years. There is fall in admissions to the hospital for various other forms of childhood tuberculosis in Singapore[7] while there is increase in Uganda[8].

There were 61% male in this study. Other Pakistani[9,10,11] and international studies[12,13,14] did not show uniformly male dominance (table-IV). The maximum cases (46%) were reported under the age of 4 years. Other studies[9,10,11,12,13,14] also gave the similar results (table-IV).

BCG scar was present in only 48.4% in this study. Other studies showed variable results[9,10, 12,14] (table-IV). Huang YF et al[13] showed very high rate (99%) of BCG vaccination. The history of contact with adult TB case was found only in 28.7% cases in this study and this rate is lower than other studies[9,10,11,12,13,14] as shown in table-IV. The reason may be underdaignbosis of adult TB cases due to poverty and poor health system. Tuberculin skin test was positive (≥10mm) 36.5%) cases while other studies[9,10,11,12,13,14] showed variable results as

Feature	Syed et al 2012(9)	Bano et al 2011(10)	Qazi et al 1998 (11)	Shrestha et al 2011 (12)	Huang YF et al (13)	Kakrani et al 1992(14)
Study population	Admitted in Civil Hospital Sialkot	Visited asthma clinic The Children's Hospital & Institute of Child Health	Pediatric Department of Federal Government Services Hospital, Islamabad.	Department of pediatrics in Nepal Medical College	Admitted in a General Hospital Taiwan	Pediatric OPD in a General Hospital India
Diagnosis	PTB 59.5 Pleural effusion 2.7% TBM 20.9% Abdominal 3.6% TB arthritis 1.3% TB lymph node 11.80% Miliary Tb 1.3%	PTB 68% Extrapumonary 32	PTB 79% TB lymph node 19% TB meningitis 5.5% Bone TB 3% Miliary TB 2.5% Abdominal TB 1%	PTB 53.7% Pleural effusion 14.6 Abdominal12.2 Disseminated 7.3 Lymph node 12.2	PTB 87.4% Bone TB 4% Cervical lymph 4% CNS 2% Miliary 2% Pleural 2%	PTB 70.7% CNS 11.7% Miliary 1.1% TB of other sites 16.5%
History of contact	38.10%	60%	64.5%	36.6%	39.8%	67.0%
BCG scar/vaccination	60%	37%.	-	48.8%	99%	55.2%
Age group 30days-4y 4-9y 10-14y	<6y 62.8% 6-12y 37.2%	-	51.5% - -	29.3% 7.3% 3.4%	55.3% 21.3% 23.3%	>50% cases above 5 years
Female	48.2%	54.5%	50%	41.5%	52.4%	50.6%
Tuberculin ≥10mm	4.9%	24%	83%	39.0%	66.7%	83.4%

Table-IV. Comparison with other national and international studies
- Not mentioned PTB pulmonary TB

shown in table-IV. The most common form of TB noted was tuberculous meningitis and pulmonary tuberculosis each accounting for 37.5% cases. While in other studies9,10,11,12,13,14 pulmonary tuberculosis was the most common form while TB meningitis accounted for 2-20% cases as shown in table-IV. The reason of higher rates of TB meningitis as compared to other studies is that children are brought in the hospital at late stage of disease.

CONCLUSIONS

The most common form of TB is meningitis and pulmonary each accounting for 37.5% cases and the maximum cases were reported under the age of 4 years.

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